Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Computational model for the production of monodisperse silver spheres in solution[1] DANIEL ROBB, IONEL HALACIUGA, VLADIMIR PRIVMAN, DAN GOIA, Clarkson University — We report the results of computational modeling of the production of monodisperse, spherical silver particles through the rapid mixing of reducing agent and silver-amine complex solutions, in the absence of a protective colloid. We find that the process can be modeled effectively by a two-stage reaction mechanism used previously to model the production of gold particles [1]. Here, we treat both the equilibrium concentration of silver atoms and the surface tension of silver particles as free parameters in our simulation, finding that the reaction time scale is fit by a narrow region of this parameter space. As in the previous work on gold particles, a kinetic 'dimer suppression factor' is required to limit the number of final particles produced. In addition, we consider an extension of the two-stage reaction model which incorporates the effect of the silver-amine complexation reaction on the availability of Ag monomers. [1] J. Park, V. Privman, and E. Matijevic, *J. Phys. Chem. B* **105**, 11630 (2001).

[1]This work was supported in part by NSF Grant DMR-0509104.

Daniel Robb
Clarkson University

Date submitted: 26 Nov 2007 Electronic form version 1.4